AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An offset compensating device comprising:

a deviation monitor unit which generates a vector signal by A/D-converting a vector sum of [[the]] results of processings applied to two quadrature AC signals individually in response to an input signal and further quadrature-demodulating a result of the A/D-converting, and which monitors a deviation of [[the]] DC components superposed on the vector signal; and

an adaptive control unit which updates a compensation vector determined in advance, on the basis of an adaptive algorithm to minimize an expectation value of a product of an inner product between an increment vector indicating an increment of said deviation with different sample times in chronological order and the compensation vector, and [[the]] a latest deviation vector indicating the deviation, and which adds the updated compensation vector to an offset vector to be inputted, while being superposed on said input signal, to a circuit to output said vector sum.

2. (Withdrawn) An offset compensating device comprising:

a deviation monitor unit which creates a vector signal by A/D-converting a vector sum of the results of processings applied to two quadrature AC signals individually in response to an input signal and by quadrature-demodulating the result of the A/D-converting and which monitors a deviation of the DC components superposed on the vector signal; and

an adaptive control unit which determines a compensation vector on the basis of an adaptive algorithm to minimize an expectation value of a product of an inner product between said input signal and said vector signal and an increment vector indicating an increment of said deviation with different sample times in chronological order, and which adds the compensation vector to an offset vector to be inputted, while being superposed on said input signal, to a circuit to output said vector sum.

3. (Withdrawn) An offset compensating device comprising:

a deviation monitor unit which creates a vector signal by A/D-converting a vector sum of the results of processings applied to two quadrature AC signals individually in response to an input signal and by quadrature-demodulating the result of the A/D-converting and which monitors a deviation of the DC components superposed on the vector signal; and

an adaptive control unit which updates a compensation vector determined in advance, on the basis of an adaptive algorithm to minimize an expectation value which is a product of an integrated value and a chronologically latest deviation vector, and which adds the updated compensation vector to an offset vector to be inputted, while being superposed on said input signal, to a circuit to output said vector sum, wherein the integrated value is a sum of past inner products being integrated, in which each of the past inner products is an inner product of an increment vector indicating an increment of said deviation with different sample times in chronological order and the compensation vector determined in advance.

4. (Withdrawn) An offset compensating device comprising:

a deviation monitor unit which creates a vector signal by A/D-converting a vector sum of the results of processings applied to two quadrature AC signals individually in response to an input signal and by quadrature-demodulating the result of the A/D-converting and which monitors a deviation of the DC components superposed on the vector signal; and

an adaptive control unit which updates a compensation vector on the basis of an adaptive algorithm to minimize an expectation value which is a product of an integrated value and an increment vector, and which adds the updated compensation vector to an offset vector to be inputted, while being superposed on said input signal, to a circuit to output said vector sum, wherein the integrated value is a sum of past inner products being integrated, in which each of the past inner products is an inner product of said input signal and said vector signal, and the increment vector indicates an increment of said deviation with different sample times in chronological order.

5. (Withdrawn) An offset compensating device comprising:

a deviation monitor unit which creates a vector signal by A/D-converting a vector sum of the results of processings applied to two quadrature AC signals individually in response to an input signal and by quadrature-demodulating the result of the A/D-converting and which monitors a deviation of the DC components superposed on the vector signal; and

an adaptive control unit which subtracts from said vector signal the inner product between an increment vector indicating an increment of said deviation with different sample times in chronological order and a compensation vector determined in advance, which updates the compensation vector on the basis of an adaptive algorithm to minimize an expectation value of the latest deviation vector indicating the deviation, and which adds the updated compensation

vector to an offset vector to be inputted, while being superposed on said input signal, to a circuit to output said vector sum.

6. (Withdrawn) An offset compensating device comprising:

a deviation monitor unit which creates a vector signal by A/D-converting a vector sum of the results of processings applied to two quadrature AC signals individually in response to an input signal and by quadrature-demodulating the result of the A/D-converting and which monitors a deviation of the DC components superposed on the vector signal; and

an adaptive control unit which subtracts an inner product between said input signal and said vector signal from said vector signal, which updates a compensation vector on the basis of an adaptive algorithm to minimize an expectation value of the latest deviation vector indicating the deviation, and which adds the updated compensation vector to an offset vector to be inputted, while being superposed on said input signal, to a circuit to output said vector sum.

7. (Cancelled)

8. (Previously Presented) An offset compensating device according to claim 1,

wherein said adaptive control unit determines an inner product of two vectors which make a common angle with respect to all axes of the vector space in a quadrant in a vector space where the two vectors to be determined in their inner product are individually positioned and which have a common absolute value.

9. (Currently Amended) An offset compensating device according to claim 1,

wherein said adaptive control unit sets a step size μ ~~to be applied to said adaptive control, to the larger value as said deviation is the larger~~ for controlling an updating degree of the compensation vector, in which ~~said step size μ is a value indicating an updating degree of the compensation vector~~ the larger the deviation, the larger the step size μ is set by the adaptive control unit.

10. (Currently Amended) An offset compensating device according to claim 1,

wherein said adaptive control unit sets a step size μ ~~to be applied to said adaptive control, to the larger value as said increment vector has the larger absolute value~~ for controlling an updating degree of the compensation vector, in which ~~said step size μ is a value indicating an updating degree of the compensation vector~~ the larger an absolute value, the larger the step size μ is set by the adaptive control unit.

11. (Currently Amended) An offset compensating device according to claim 1,

wherein the larger [[the]] a deviation determined in advance, the shorter the interval said deviation monitor unit smoothes said DC component ~~in shorter interval, and updating the compensation vector~~.

12. (Currently Amended) An offset compensating device according to claim 1,

wherein the larger [[the]] an absolute value of said increment vector, said deviation monitor unit smoothes said DC component ~~in shorter interval, and updating the compensation vector~~.

13.- 14. (Cancelled)

15. (Previously Presented) An offset compensating device according to claim 1,

wherein said adaptive control unit acts intermittently at a frequency for said compensation vector to be updated.

16. (Currently Amended) An offset compensating device according to claim 1,

wherein said adaptive control unit stops when the deviation ~~determined in advance~~ becomes lower than a predetermined lower limit.

17. (Previously Presented) An offset compensating device according to claim 1,

wherein said adaptive control unit stops when the absolute value of said increment vector becomes lower than a predetermined lower limit.

18. (Currently Amended) An offset compensating device according to claim 1, further comprising a dispersion monitor unit which monitors a dispersion of the deviation ~~determined in advance~~,

wherein said adaptive control unit stops when said dispersion becomes lower than a predetermined threshold value.

19. (Previously Presented) An offset compensating device according to claim 1, further comprising;

a dispersion monitor unit which monitors a dispersion of the absolute value of said increment vector,

wherein said adaptive control unit stops when said dispersion becomes lower than a predetermined threshold value.

20. (Previously Presented) An offset compensating device according to claim 1,

wherein said deviation monitor unit monitors the deviation of said DC component with reference to a DC component superposed on said input signal.

21. (Currently Amended) An offset compensating device according to claim 1, further comprising:

a quasi-offset monitor unit which detects [[the]] an instant when [[the]] an average of a DC component superposed on said input signal becomes "0",

wherein said deviation monitor unit and said adaptive control unit start every time when said instant is detected by said quasi-offset monitor unit.

22. (Currently Amended) An offset compensating device according to claim 1,

wherein said deviation monitor unit specifies [[the]] a period for which [[the]] a level of [[the]] a component of said vector signal in a low range for [[the]] an offset caused in said circuit to distribute is lower than a predetermined lower limit, and

wherein said adaptive control unit stops for the period specified by said deviation monitor unit.

23. -28 (Cancelled)